

UNIVERSITY COLLEGE OF RHODESIA AND NYASALAND

THE REQUIREMENTS AND SUPPLIES OF HIGH
LEVEL MANPOWER IN SOUTHERN RHODESIA
1961—1970



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PREFACE

This report on the High Level Manpower requirements in Southern Rhodesia arose out of discussions with Mr. Alan Pifer in 1960. Subsequently a grant from the Carnegie Corporation made it possible for Professor E. A. G. Robinson of Cambridge University, England, to visit the College in December 1960 to advise on the feasibility of such a survey. On the basis of his report the Carnegie Corporation graciously provided a grant which made available the advice and assistance of Professor F. Harbison, Director of the Industrial Relations Section of Princeton University and Professor G. Seltzer of the Industrial Relations Center of the University of Minnesota, together with that of Professor Robinson, for the purpose of conducting a survey of High Level Manpower requirements in the territories which then constituted the Federation of Rhodesia and Nyasaland. Professor Seltzer was able to visit the College for some months to acquaint himself with local conditions and Professors Harbison and Robinson were both able to make shorter visits.

The College set up an internal Manpower Survey Sub-Committee of Professors Milton, Taylor and Mitchell to co-ordinate and administer the scheme and to serve as an advisory body. The College also called upon a committee of 12 members of Government Departments, Mining, Farming, Industrial and Management organisations to advise it on matters affecting the survey.

The study fell at an awkward time. The Federation was on the point of dissolution and the political future was uncertain. This complicated the task of those concerned with the study, for the effect of political events on economic growth and on the requirements for high level manpower is vitally important. These uncertainties contributed to the difficulties of estimating future trends of economic growth.

The draft report went through several transformations as the political horizon cleared and as additional factual information became available. The final version has effectively been drafted by Professor W. L. Taylor and Mr. D. S. Pearson of the College Economics Department and has been commented on by the several advisors involved.

There are many variables which affect economic growth and manpower requirements. The trends of some of these variables may be known sufficiently well to provide the basis of accurate forecasting; the trends of others, with the information and analytical resources at our command, may be uncertain. The effect of other variables, such as

political factors, may not only be unpredictable, but also impossible to state in quantitative terms.

For estimating purposes, however, it is necessary to make a number of assumptions about uncertain factors which appear reasonable at the time of writing. Time, before long, will almost certainly falsify some of them. The estimates at the time of writing, therefore, may have an appearance of certainty and verisimilitude which is in fact spurious: the assumptions on which the estimates are based should always be taken into account.

The intention throughout has been to arrive at an estimate of *minimum* High Level Manpower requirements. The tendency in all stages of estimation therefore has been to make conservative appraisals of the factors influencing the supply of manpower. We have considered it wiser to err on the side of safety than to over-estimate requirements.

This survey, in fact, must be looked upon as providing a first approximation subject to successive improvements as information increases and knowledge widens.

One of the positive findings of the survey, indeed, has been that there is a lack of official statistics and other information on which estimates of manpower requirements can be based. The uncertainties of these first estimates emphasise the need for a continuing re-assessment of manpower needs as more and more information becomes available. Educational plans must then be related to these revised estimates of manpower requirements. A High Level Manpower Committee under Government auspices is clearly needed for this purpose.

We are grateful to the Carnegie Corporation for providing the funds that made the survey possible; to the members who served on the Advisory Committee; to the various Government officials who provided information vital to the survey; to Professors Robinson, Harbison and Seltzer for their advice and assistance; and particularly to Professor W. L. Taylor and Mr. D. S. Pearson of the College Department of Economics on whose shoulders fell the burden of preparing the final report.

J. C. MITCHELL.

Chairman,

U.C.R.N. Manpower Survey Sub-Committee.

March, 1964.

THE REQUIREMENTS AND SUPPLIES OF HIGH LEVEL MANPOWER IN SOUTHERN RHODESIA 1961-1970

I

THE ISSUES

1. In any country, the achievement of economic progress and higher standards of life depends in part on natural resources and the capital to exploit them. But in very large measure it depends also on the extent of the available human resources of trained manpower with the professional skills to exploit other resources and to run a modern complex economy.

2. Education and training is a long process. The numbers of persons emerging at the end of the educational process can be varied significantly only after a period long enough for those persons to have passed through all the earlier stages of education. Thus, the planning of training and education needs to be based on a long view of the probable requirements for trained personnel.

3. The purpose of this report is to forecast as accurately as possible the needs for skilled manpower in Southern Rhodesia in 1970 and the potential supplies on the basis of present and proposed educational plans.

II

THE DEFINITION OF HIGH LEVEL MANPOWER

4. The concept of High Level Manpower (HLMP) has been designed to cover those higher skills that are of critical strategic importance for the development of any economy. It may be defined either in terms of the types of occupations concerned or in terms of the educational attainments required satisfactorily to fill those occupations. The relationship of educational attainment to occupation is not permanent and static. As a society advances the educational qualifications of those who fill given occupations are likely also to advance. In a backward economy certain occupations are necessarily filled in the present by persons who lack the full educational qualifications that may be desirable even ten years ahead. Some allowance has been made for this by fixing lower minimum qualifications and dividing lines between categories than would be fixed in more developed countries.

5. For purposes of this report the Southern Rhodesia working population of all races in all occupations has been divided into four major categories, as set out in Table 1. Categories I, II and III constitute the High Level Manpower of the country. Category IV represents the remainder of the working population. (See Table 1).

TABLE 1
Formulation of "High-level" Manpower Concept

<i>Category</i>	<i>Representative (Occupational Titles</i>	<i>Educational Attainment and/or Requirement Category</i>
I. "Professional- Administrative"	<ul style="list-style-type: none"> —Senior Civil Servants and principals of large sized establishments in both the private and public sectors. —professional personnel. e.g. doctors, chemists, engineers, geologists, architects, lawyers, veterinarians, agronomists, etc. —secondary school teachers. 	University graduate or other form of post-secondary education (e.g. accountants).
II. "Technical - Executive"	<ul style="list-style-type: none"> —executive civil servants. —sub-professional personnel. e.g. draftsmen, qualified nurses, laboratory technicians, etc. —principals of medium-sized enterprises. —secondary and technical school teachers* 	1-3 years beyond Form IV in college, technical institution or teacher training institution.
III. "Skilled"	<ul style="list-style-type: none"> —clerical officers in Civil Service, qualified artisans, etc. —first-level supervision, i.e. foremen, section heads, etc. —primary school teachers* —stenographers, accounts clerks, salesmen, advanced farmers, etc. 	1-5 years beyond Form III in apprenticeship or special training institution.
IV. "All Others"	<ul style="list-style-type: none"> —labourers, sales assistants, copy typists, etc. 	

*Teachers have been classified as follows:

Non-African Education

"Graduate" teachers.	I
"Qualified" teachers.	II

African Education

Upper Secondary School Teachers.	I
Lower Secondary School Teachers.	II
"Trained" Primary School Teachers.	III

III

THE PROBLEMS OF FORECASTING REQUIREMENTS

6. In order to forecast Southern Rhodesia's requirements for High Level Manpower in 1970, it is necessary to proceed by five stages:

- (i) to establish the 1961 stock of HLMP, both in total and in particular categories ;
- (ii) to work out a satisfactory means of calculating the proportionate increase of that stock likely to be required by 1970 and thus the actual stock required in 1970, both in total and in particular categories ;
- (iii) to calculate from this the number of persons in each category who will be required to provide for the growth of HLMP as estimated in (ii) above ;
- (iv) to calculate the probable wastage during the period 1961-70 in the 1961 stock of HLMP and thus the numbers needed to be trained or otherwise secured to cover the replacement of wastage both in total and in particular categories ; and
- (v) to estimate from (iii) and (iv) together the total requirements of HLMP and compare them with the estimated out-turns from education of persons with the educational qualifications or skills both in total and in particular categories.

IV

THE 1961 STOCK OF HIGH LEVEL MANPOWER

7. It has been necessary to estimate non-African and African HLMP in 1961 by different methods in order to make the best use of the available statistical evidence.

(a) Non-African.

8. The estimates of non-African HLMP for most sectors are based on the 55 per cent sample survey of the September 1961 non-African census. The sampling error in a sample of this size is not likely to be such as to modify significantly the figures calculated in this report. In the case of education, however, more reliable data has been obtained from direct information regarding the numbers of non-African teachers of varying qualifications, which are given in the *Annual Reports* of the Federal and Southern Rhodesia Ministries of Education.

9. On the basis of this evidence, the non-African total of HLMP may be estimated at about 78,200, distributed between the categories as shown in Table 2.

10. The total of 78,200 non-African HLMP may be compared with the figure 101,000 economically active non-African population in

TABLE 2

Estimates of Non-African HLMP in Southern Rhodesia in 1961(a)

	Category <i>I</i>	Category <i>II</i>	Category <i>III</i>	Total
Agriculture	240	380	7,930(d)	8,550
Mining	250	520	2,000	2,770
Education(b)	540	1,470	410	2,420
Govt. Administration	320	1,080	6,650	8,050
All other(c)	3,640	13,260	39,500	56,400
Total	4,990	16,710	56,490	78,190

(a) Based on the 55 per cent sample survey of the Non-African Census of Population, unless otherwise stated.

(b) Calculated on the basis of the Annual Reports of the Southern Rhodesia and Federal Ministries of Education.

(c) This total is made up of the following:

	Category <i>I</i>	Category <i>II</i>	Category <i>III</i>	Total
Manufacturing	590	2,510	10,130	13,320
Construction	600	1,190	3,630	5,420
Finance and Commerce	500	6,550	11,370	18,420
Transport	250	950	5,150	6,350
Other Services	1,330	1,620	3,870	6,820
Others n.e.s.	370	440	5,350	6,160
Total	3,640	13,260	39,500	56,400

(d) Professor George Seltzer has expressed his doubts as to whether there is as large a number of HLMP, as here defined, engaged in agricultural activities. If he is right the estimates of requirements throughout will need to be reduced accordingly.

Southern Rhodesia in September 1961. The proportion of non-African HLMP to the total economically active non-African population, viz. 77 per cent, may be compared with the comparable figure of 80 per cent in Northern Rhodesia.

(b) *African:*

II. The evidence for the African total of HLMP in Southern Rhodesia is less firm than that for the non-African sector. Comparatively reliable information exists for government employment; the numbers in African education (11,300) health services (900) and Government Administration (4,000) are available and total approximately 16,200. There arise, however, certain problems, here and elsewhere, in establishing minimum qualifications for inclusion of certain posts or their

present holders in the HLMP categories. In the present, for example, a number of teaching posts are in fact held by persons whose actual qualifications are less than those properly regarded as attaching to the post. It has been thought right to include such holders of posts in the 1961 total, since before 1970 it is hoped to raise the actual qualifications above the minimum standard.

12. For the remaining African HLMP to be found in the private sector of the economy, less direct evidence must be used. This relates partly to Africans earning certain incomes and partly to the numbers of African farmers with certain minimum training and technical qualifications in the Native Purchase Areas.

13. *The National Accounts of the Federation of Rhodesia and Nyasaland, 1954-1962* includes a table showing the income distribution of Africans in paid employment. It has been assumed that Africans earning more than £15 a month may reasonably be regarded as possessing the minimum qualifications or skills for Category III of HLMP or are engaged in occupations which could properly be included in Category III¹. In agriculture, on the other hand, where the ratio of skilled to unskilled workers is much lower than in other sectors, it is assumed that the proportion of HLMP to total numbers employed is only half the figure for other sectors of the economy.

14. In addition, there are a number of African farmers whose qualifications and skills may be regarded as sufficient to justify their inclusion in Category III. Since 1945, minimum agricultural qualifications have been required of those seeking to be allocated farms in the Native Purchase Areas and, since 1953, a Master Farmer's Certificate has been necessary, showing evidence of agricultural education equivalent in character to the minimum skills implied in Category III. At December 1961, there were 6,432 farms allocated in the Native Purchase Areas: there were in addition 2,721 approved applicants on the waiting list². It is therefore reasonable to add 9,150 to Category III on this account.

15. Drawing together the estimates mentioned in the preceding four paragraphs, the stock of African HLMP is estimated to be 46,400 as shown in Table 3. In Table 4, the estimates of the total stock of HLMP, both non-African and African, are brought together, giving a total estimated stock in 1961 of 124,600.

(1) The cut-off point of £15 per month used in the Southern Rhodesia calculations may be compared with the figure of £17.10.0 used for the same purpose in the Northern Rhodesia calculations. The justification of the use of different cut-off points is that average wages of Africans in employment in Northern Rhodesia are significantly higher than in Southern Rhodesia, even after the mining sector has been excluded; and that the number of Africans in Southern Rhodesia earning more than £15 per month as a proportion of the total number employed is less than the proportion in Northern Rhodesia earning more than £17.10.0 per month.

(2) See *Report of the Advisory Committee on the Development of the Economic Resources of Southern Rhodesia with particular reference to the role of African Agriculture, 1962*. (C.S.R. 28-1962). Some of those on the waiting list may be employed in HLMP posts already so that there is possibly a small error due to 'double counting' here.

TABLE 3
Estimates of African HLMP in Southern Rhodesia in 1961(a)

	<i>Category I</i>	<i>Category II</i>	<i>Category III</i>	<i>Total</i>
Agriculture(b)	N	N	16,530	16,530
Mining	10	30	3,010	3,050
Education(c)	30	1,770	9,490	11,290
Govt. Administration(d)	10	40	3,900	3,950
All Other	30	120	11,450	11,600
Total	80	1,960	44,480	46,420

N=Negligible.

- (a) Based on the number of Africans receiving monthly earnings in excess of £15. 0. 0., unless otherwise stated.
- (b) Overall proportion of Africans earning more than £15 p.m. to total Africans in employment=6.3 per cent. For the agricultural sector, it is assumed that only half this proportion qualifies for inclusion in HLMP. When Master Farmers are added, this gives a total for the agricultural sector of $7,380 + 9,150 = 16,530$.
- (c) Calculated on the basis of the **Annual Reports** of the Southern Rhodesia Ministry of Native Education and the **Report of the Southern Rhodesia Education Commission (C.S.R.37—1963)**.
- (d) Based on information supplied by government departments.

TABLE 4
Estimates of Total HLMP in Southern Rhodesia in 1961
(Thousands)(a)

	<i>Category I</i>	<i>Category II</i>	<i>Category III</i>	<i>Total</i>
Agriculture	0.2	0.4	24.5	25.1
Mining	0.3	0.5	5.0	5.8
Education	0.6	3.2	9.9	13.7
Govt. Administration	0.3	1.1	10.6	12.0
All Other	3.7	13.4	50.9	68.0
Total	5.1	18.6	100.9	124.6

- (a) From Tables 2 and 3. Figures do not necessarily add to totals shown due to rounding off.

V

THE GROWTH OF HIGH LEVEL MANPOWER, 1954-61.

16. For purposes of further analysis, it is of interest to estimate the growth of the stock of HLMP in Southern Rhodesia since 1954. It is believed that it would not be unreasonable to assume:

- (i) that non-African HLMP bore the same relationship to total non-African employment in 1954 as in 1961 ;
- (ii) that total HLMP has grown at the same percentage rate as the Gross Domestic Product measured at constant prices. (See Appendix I).

17. On this basis the approximate growth of total HLMP between 1954 and 1961 may be estimated giving an increase of 44,200 or 55 per cent as shown in Table 5. Of this, the stock of African HLMP rose by 24,200 or 107 per cent and of non-African HLMP, by 20,200 or 35 per cent.

TABLE 5

Estimated Growth in HLMP in Southern Rhodesia, 1954 to 1961

	<i>African</i>		<i>Non-African</i>		<i>Total</i>	
	1954	1961	1954	1961	1954	1961
Employment '000's (excl. Domestic service)	482.9	529.2	65.6	88.5	548.5	617.7
HLMP '000's	22.4	46.4	58.0	78.2	80.4	124.6
Index (1954=100)	100	207	100	135	100	155

VI

THE FUTURE GROWTH OF DEMAND FOR HIGH LEVEL MANPOWER

18. In order to estimate the future demand for HLMP, it is best to start with one or more estimates of the future growth of the Gross Domestic Product of Southern Rhodesia in real terms. Any increasing demand for HLMP will be derived from the need to organise production on a larger and more complex scale; the capacity to pay for larger governmental and social service employment of HLMP is likely to derive from an increase in the national income.

19. The real Gross Domestic Product of Southern Rhodesia, measured at constant prices (and thus showing the increased volume of product) has been estimated to have increased by 58 per cent from 1954 to 1962. (See Table 6).

TABLE 6

Gross Domestic Product in the Money Economy of Southern Rhodesia, 1954-1962, at 1954 prices(a)

	<i>£ Million</i>	<i>Index(b)</i>
1954	160.1	100.0
1955	175.3	109.5
1956	203.3	127.0
1957	220.0	137.4
1958	223.5	139.6
1959	235.3	147.0
1960	242.0	151.2
1961	253.3	158.2
1962	254.3	158.8

(a) Source: Supplement to the "National Accounts of the Federation of Rhodesia and Nyasaland, 1954-1962", Table 18. Central Statistical Office, Salisbury. October, 1963.

(b) 1954=100.0.

VII

THE GROWTH OF HIGH LEVEL MANPOWER, 1961-1970

20. The information given in Table 6 is subject to alternative methods of statistical analysis. For the period 1954 to 1962 the trend of closest fit has been calculated (by the Central Statistical Office in the *Supplement to the "National Accounts of the Federation of Rhodesia and Nyasaland, 1954-1962"*) to be a parabolic function of the form

$$y = 159.9 + 21.9t - 1.3t^2 \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where y = GDP in £ million at 1954 prices; and t = number of years from 1954.

Alternatively a linear trend can be calculated of the form

$$y = 168.9 + 12.9t \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

where y and t are the same as in equation (1), which also gives a reasonably close fit.

21. If the parabolic relationship between time and the GDP is used to forecast the GDP to 1970, it is found that the GDP begins to decrease beyond 1963. It is unrealistic to assume that the GDP will in fact decrease between 1963 and 1970. Accordingly the linear trend set out in equation (2) in paragraph 20 has been used to estimate the probable GDP until 1970. This gives an estimated GDP at 1954 prices for 1970 of £362.4 million, equivalent to a 40 per cent rise on 1961 or an average simple annual increase of 4.45 per cent on the 1961 figure. (See Appendix II).

22. In order to simplify discussion only one estimate of economic growth—probably a conservative estimate—has been used in the calculations that follow. If the actual rate of growth proves different from this the estimates of HLMP requirements will need to be varied accordingly.

23. In estimating the growth of HLMP between 1954 and 1961 it was assumed that HLMP rose at the same proportionate rate as the volume of GDP. In order to estimate the future demand for HLMP a similar assumption regarding its relationship to the volume of GDP may be made. This will indicate the lowest level of future demand for HLMP which can reasonably be forecast on the assumption of an average increase between 1961 and 1970 of 4.45 per cent GDP on the 1961 figure.

24. On the other hand, there is some reason to suspect that the future demand for HLMP will rise at a faster rate than the volume of GDP. This is because if Southern Rhodesia's economy is to develop, the supply of technical and professional services in relation to the total level of economic activity will have to be increased. It will be generally agreed that in certain sectors, e.g., agriculture, a significant rise in output will depend on the prior provision of both technical extension services and general infrastructure facilities, and this presupposes an adequate supply of trained personnel.

25. In the light of paragraphs 23 and 24, it has been thought necessary to postulate two levels of growth of HLMP in relation to the projected rate of growth of GDP calculated in paragraph 21. Appendix II outlines these estimates on the basis of alternative functions of GDP and HLMP of 1:1 and 1:1.25, referred to as Level I and Level II respectively. The results of these calculations are shown in Table 7.

TABLE 7

Estimated Required Stock of HLMP in Southern Rhodesia in 1970

	<i>Level I</i>	<i>Level II</i>
Category I	8.2	9.2
Category II	26.0	30.0
Category III	140.2	160.2
	<hr/>	<hr/>
Total	174.4	199.4

26. The exception to the procedure outlined in paragraph 25 is the education sector, for which direct evidence regarding the future demand for HLMP has been made available by the Southern Rhodesia Ministry of African Education. The results of this amendment to Table 7 are contained in Tables 8 and 9.

TABLE 8

Estimate of HLMP Requirement for Growth, excluding Education, in Southern Rhodesia 1961-1970

	<i>1961 Stock(a)</i>	<i>Growth Requirements</i>	
		<i>Level II</i>	<i>Level I</i>
Category I	4.5	1.8	2.3
Category II	15.4	6.2	7.7
Category III	91.0	36.4	45.5
	<hr/>	<hr/>	<hr/>
Total	110.9	44.4	55.5

(a) Total from Table 4 **minus** Education.

27. In Table 10, the estimates contained in Tables 8 and 9 are brought together and combined with estimates of requirements in the Education sector to give the total probable requirements of HLMP in Southern Rhodesia between 1961 and 1970, distributed between the three categories.

TABLE 9

Estimate of Normal and Abnormal Wastage of HLMP

	<i>Normal Wastage excluding Education(a)</i>	<i>Abnormal Wastage(b)</i>	<i>Total Requirements for Replacement(c)</i>
Category I	1.2	0.4	1.6
Category II	4.2	1.5	5.7
Category III	24.6	5.1	29.7
Total	30.0	7.0	37.0

(a) 27 per cent of column 1 in Table 8.

(b) 9 per cent of non-African HLMP from Table 2, including Education.

(c) Column 1 **plus** column 2.

28. Any final decision regarding the acceptance of one or other of the estimates as a basis for planning must be a political decision. But certain points should be stressed. The demand for HLMP implied by Level I represents the probable minimum demand on the assumption that the Southern Rhodesia economy is able to maintain a total rate of growth not less than the rate of increase in population. Level II may be regarded as an estimate of the *maximum* likely demands for HLMP, again assuming a minimal rate of economic growth without any decline in average income per head. If, on the other hand, the Southern Rhodesia economy should grow more rapidly than is estimated in Appendix II, then the demand for HLMP is likely to be considerably higher than the estimates shown in Table 10.

29. The figures in Table 10 assume the same proportionate distribution between Categories in the 1970 stock as in the 1961 stock, with the exception of the education sector for which direct estimates are available. However, just as it was argued in paragraph 24 that Southern Rhodesia's future economic growth may require a more than proportional increase in HLMP, so it can also be argued that the requirements in Category I of HLMP will be proportionally greater than in Category III. It is not possible to make any precise estimates of magnitude in this connection but it has been thought reasonable to make some upward adjustment to the projected requirements in Category I. The effect of this is shown in Table II. According to these revised estimates, the total demand for HLMP between 1961 and 1970 will range between approximately 96,000 and 107,000 HLMP. Details of the distribution between Categories are also given in Table 11.

TABLE 10
Revised Estimate of Total HLMP Requirements by Categories in
Southern Rhodesia, 1961-1970

	<i>Growth Requirements Level I</i>	<i>Level II</i>	<i>Replacement Requirements(b)</i>	<i>Requirements for Education Sector</i>	<i>Total of All Requirements Level I</i>	<i>Level II(a)</i>
Category I	1.8	2.3	1.6	0.6	4.0	4.5
Category II	6.2	7.7	5.7	8.9(c)	20.8	22.3
Category III	36.4	45.5	29.7	5.3(c)	71.4	80.5
Total	44.4	55.5	37.0	14.8	96.2	107.3

(a) Excluding education.

(b) From Table 9, column 3.

(c) This figure differs from the Ten Year Plan made available to the Judges Commission in that allowance has been made for a subsequent decision to upgrade some teaching positions, formerly requiring only Lower Teaching Certificates, to positions requiring Higher Teaching Certificates.

TABLE 11
Revised Estimates of Total Requirements of HLMP in Southern Rhodesia, 1961-1970(a)

	<i>Level I</i>	<i>Level II</i>
Category I	5.0	5.5
Category II	20.8	22.3
Category III	70.4	79.5
	-----	-----
Total	96.2	107.3

(a) Based on Table 10, columns 5 and 6, after adjusting for some upgrading between Categories.

VIII

REPLACEMENTS

30. In considering the necessary out-turn of suitably qualified HLMP it is necessary to make provision not only for the growth of the required stock, as has been done in the last few paragraphs, but also for the replacement of those members of the 1961 stock who may cease to be available, either as the result of normal wastage through death or retirement, or as the result of abnormal wastage consequent on emigration or withdrawal due to political or other causes.

31. In a stable advanced country it would be natural to assume an average working life of about 40 years and an annual wastage rate of about 2.5 per cent. In Southern Rhodesia, where persons tend to retire earlier and in some cases to enter the HLMP stock later, an assumed average working life of 33 years may be more appropriate, with an annual wastage rate of 3 per cent, giving a cumulative wastage of 27 per cent over the nine years 1961-70.

32. It is more difficult to know what allowance should be made for abnormal wastage. While there may be special reasons for abnormal wastage in particular categories of HLMP and in particular occupations within them, many of those affected are likely to regard Southern Rhodesia as their home and to move to other HLMP occupations within the economy. The more relevant question is what proportion of the whole may move completely out of the economy and thus create a need for net replacement. It would seem that this abnormal wastage affects almost exclusively the non-African component of HLMP and that an allowance of 1 per cent per annum is probably sufficient to cover it¹. This would be equivalent to a further 9 per cent wastage of the non-African component of HLMP over the nine year period, or a total of 7,000 HLMP. The results of these calculations have already been incorporated in Tables 9 and 10.

INTAKE FROM SOUTHERN RHODESIA EDUCATION

33. In order that the estimated required intakes shown in Table 11 may be compared with the probable output from Southern Rhodesia's educational system, combined with the education of Southern Rhodesians outside the territory, separate estimates have been made for non-Africans and Africans. While no distinction between requirements for African and non-African HLMP has been made or would be useful, the limiting factors on the expansion of training are different in the two cases and must take account of the educational pyramids involved and the differing problems of expanding secondary education in the two cases.

34. In Table 12, figures are given, based on estimates prepared by the Federal Ministry of Education, to show the estimated out-turn 1961-70 of potential non-African HLMP. The estimates make reasonable provision for the loss to the potential HLMP force due to education of girls who may not enter the labour force.

35. As in the case of the replacement of the 1961 stock of HLMP, the question arises of how far provision must be made for abnormal wastage of those who may be trained in Southern Rhodesia and subsequently be lost to the Southern Rhodesia economy through emigration during the first nine years of their working lives. It has been thought proper to allow a 10 per cent wastage to cover both this and the small normal wastage from death during the first nine years of their working life.

TABLE 12
Estimated Out-turn of Non-African HLMP 1961-1970(a)
(Thousands)

	<i>Estimated Out-turn of Education</i>	<i>Allowance for Wastage (10%)</i>	<i>Net Out-turn Available</i>
Category I	2.75	0.25	2.5
Category II	24.00	2.50	21.5
Category III	20.00	2.00	18.0
Total	46.75	4.75	42.0

(a) The figures have been rounded.

36. It is more difficult to make satisfactory estimates of the probable out-turn of HLMP from the education of Southern Rhodesian Africans. Assumptions have to be made both regarding the developments of the more normal types of education in schools and universities and the future contribution of correspondence colleges and other less orthodox forms of education which have been important in Southern Rhodesia in the past. The contribution of upgrading personnel at present em-

(b) The rate is probably higher than this: if it is then the effect will be to underestimate High Level Manpower requirements as stated in this report.

ployed in Category IV to take HLMP posts through special training, cannot be estimated.

37. In Table 13 an estimate has been made of the out-turn that would result if the Ten Year Plan, 1963-1973, proposed by the Southern Rhodesia Ministry of African Education for the Judges Commission, is put into effect. This estimate takes account of all types of formal education which may be held to produce potential HLMP. In this estimate an allowance has been made for failures to reach the required levels of educational attainment, based on past experience in African Schools in both Northern and Southern Rhodesia. The failure rates used are shown in Table 13.

TABLE 13

Estimated Out-turn of African HLMP, 1961-1970

Form II enrolment	39,100	
less Form II failures (25%)	9,800	
	<hr/> 29,300	
less Form IV enrolment	6,900	
	<hr/> 22,400	
plus Form IV failures (30%)	2,100	
	<hr/> 24,500	
less Non-participants(a)	2,000	22,500 in Category III
	<hr/> 6,900	
Form IV enrolment	6,900	
less Form IV failures	2,100	
	<hr/> 4,800	
less Form VI enrolment	800	
	<hr/> 4,000	
plus Form VI failures (65%)	500	
	<hr/> 4,500	
less Non-participants(b)	100	4,400 in Category II
	<hr/> 800	
Form VI enrolment	800	
less Form VI failures	500	300 in Category I
	<hr/> 27,200	
Total supplies of African HLMP		

(a) Assumes 20 per cent of the students are girls, of whom 40 per cent will not enter the labour force.

(b) Assumes 10 per cent of the students are girls, of whom 30 per cent will not enter the labour force.

38. In addition to the out-turn of African Schools, some allowance must also be made for those Africans who gain HLMP qualifications through correspondence colleges. On the basis of past experience, it is

estimated that total registrations in correspondence colleges between 1961 and 1970 will amount to about 13,500. However, only a small proportion of students who commence correspondence courses are successful in their final examinations, so that the net contribution of this form of education is estimated to be only 3,700 over the period. These figures are shown in Table 14.

TABLE 14
Estimated Out-turn of Correspondence Colleges

	<i>Category I</i>	<i>Category II</i>	<i>Category III</i>	<i>Total</i>
Registrations	500	3,000	10,000	13,500
less failures	400(80%)	2,400(80%)	7,000(70%)	9,800
Net out-turn	100	600	3,000	3,700

39. In principle, some small allowance should again be made for wastage due to death or withdrawal from the HLMP force or emigration. The former is a small figure and, in view of the uncertainties of the estimates, it may be neglected. The problem of migration will be considered later in a more general context.

X

THE BALANCE OF SUPPLY AND DEMAND

40. From the estimates in Tables 12, 13 and 14, the total supply of potential recruits to the HLMP force can be deduced. (See Table 15).

TABLE 15
Estimate of Total Supplies of HLMP in Southern Rhodesia 1961-1970(a)

	<i>Category I</i>	<i>Category II</i>	<i>Category III</i>	<i>Total</i>
Out-turn of Non-African education	2.5	21.5	18.0	42.0
Out-turn of African schools	0.3	4.4	22.5	27.2
Out-turn of African Correspondence Colleges	0.1	0.6	3.0	3.7
Total Supplies of HLMP	2.9	26.5	43.5	72.9

(a) From Tables 12, 13 and 14.

41. It is now possible to set the estimates of the total supply of potential HLMP against the earlier estimates of requirements, at both levels, as given in Table 11.

42. It can be seen from Tables 16 and 18 that, depending upon the assumptions made regarding both the rate of economic growth and the relationship between economic growth and the demand for HLMP, Southern Rhodesia is likely to have a shortage of HLMP amounting to between 13 and 18 per cent of the estimated required stock in 1970, or between 23,000 and 35,000 persons with HLMP qualifications. The prospective gap is relatively greatest, as might be expected, in Category I; where at least one quarter of the expected required stock, or nearly half of the requisite supplies, will have to be met from outside Southern Rhodesia. Alternatively, the gap could be filled by upgrading personnel from Category II, even though these lack the qualifications assumed to be necessary for Category I occupation; although, to the extent that this takes place, the shortage at the Category III level will be that much increased.

43. In one sense, the Category I deficit gives less cause for concern than some of the other deficits, since the possessors of Category I qualifications are more than normally mobile and many of the posts involved are likely to require very specialist professional qualifications which Rhodesian education cannot be expected to meet in full or Southern Rhodesians to acquire in exactly the appropriate numbers from education abroad. It may be possible to find recruits for these Category I posts abroad. But it may well give rise for concern that so many of these top-level posts seem likely to be held by persons from outside the territory.

TABLE 16

Comparison of Total Requirements and Supplies of HLMP in Southern Rhodesia, 1961-1970
(Thousands)

	<i>Total Estimated Requirements(a)</i>		<i>Total Estimated Supplies(b)</i>	<i>Estimated Surplus (+) or Deficit (-)(c)</i>	
	<i>Level I</i>	<i>Level II</i>		<i>Level I</i>	<i>Level II</i>
Category I	5.0	5.5	2.9	- 2.1	- 2.6
Category II	20.8	22.3	26.5	+ 5.7	+ 4.2
Category III	70.4	79.5	43.5	-26.9	-36.0
Totals	96.2	107.3	72.9	-23.3	-34.4

(a) From Table 11.

(b) From Table 15.

(c) *Supplies minus requirements.*

44. On the other hand, there seems likely to be a somewhat larger out-turn of Category II HLMP than the number of posts estimated to be available. That is not a matter for regret. A number of the posts assumed to be filled by Category III HLMP would in any more advanced country be filled by persons with Category II qualifications.

This particularly applies to education, but is true also of many of the middle cadres of industry and commerce. No serious problem is likely to be created by this surplus, but it may well imply somewhat more severe competition among non-Africans for Category II posts than they have experienced in the past.

45. The biggest absolute deficit would appear to be in Category III, where there would seem likely to be a shortage of the order of 27,000-36,000 persons. In percentage terms, this means a deficit of between 19 and 24 per cent in the required stock of Category III personnel in 1970, or an increase of between one half and three-quarters in the likely supply during the period 1961-1970, even after the projected surplus in Category II has been offset against the Category III deficit. At this level of employment, the deficit is much less likely to be filled by net immigration than is the case with the deficit in Category I.

46. In interpreting these key figures it should at all times be borne in mind that they are based on an annual rate of growth in Southern Rhodesia's Gross Domestic Product equivalent to a geometric rate of only 3.7 per cent per annum. This may be compared with recent estimates of the rate of growth of the African population of Southern Rhodesia of between 3 and 3.5 per cent per annum (geometric). Thus, the rate of growth assumed in this *Report* is probably little more than sufficient to maintain real incomes per head at their 1961 level of £75 per annum.

47. It is impossible to predict with any confidence the future levels of immigration into Southern Rhodesia. It involves guessing not only the possible attractiveness of posts offering in Southern Rhodesia and of life more generally in the country, but also the pressures and frustrations, both economic and political, that may be operating in the countries of emigration.

TABLE 17

**Estimates of Required Stock of HLMP in Southern Rhodesia in 1970
(Thousands)**

	1961 Stock(a)	Requirements for Growth(b)		Require- ments for Education(c)	Total Required Stock	
		Level I	Level II		Level I	Level II
Category I	5.1	2.8	3.3	0.4	8.3	8.8
Category II	18.6	6.1	7.6	8.0	32.7	34.2
Category III	100.9	35.5	44.6	2.6	139.0	148.1
Totals	124.6	44.4	55.5	11.0	180.0	191.1

(a) From Table 4.

(b) From Tables 8 and 9, excluding Education.

(c) From Table 10 *minus* normal wastage.

TABLE 18
Comparison of Required and Available Stock in 1970
(Thousands)

	<i>Required Stock(a)</i>		<i>Available Stock in 1970(b)</i>	<i>Surplus (+) or Deficit (—)(c)</i>	
	<i>Level I</i>	<i>Level II</i>		<i>Level I</i>	<i>Level II</i>
Category I	8.3	8.8	6.2	— 2.1(25%)	— 2.6(30%)
Category II	32.7	34.2	38.6	+ 5.7(17%)	+ 4.2(12%)
Category III	139.0	148.1	112.1	—26.9(19%)	—36.0(24%)
Totals	180.0	191.1	156.9	—23.3(13%)	—34.4(18%)

(a) From Table 17.

(b) From Table 15.

(c) Available Stock *minus* Required Stock. Figures in brackets show surplus or deficit as a percentage of the required stock.

48. For the period 1955-1962 the number of arrivals is shown in Table 19. These figures cover not only Southern Rhodesia, but also Nyasaland and Northern Rhodesia. Of the total of immigrants during the nine years, about two-thirds declared Southern Rhodesia as their country of initial destination. But nothing is known regarding either subsequent movements within the Federation or the territorial division of departures. Although it seems likely that up to 1962 the turnover was greater in Northern Rhodesia, there has been a considerable efflux of non-Africans out of Southern Rhodesia during the past two years.

TABLE 19
Net Migration of Non-Africans into the Federation of Rhodesia and Nyasaland, 1955-63(a)
(Thousands)

	<i>Arrivals</i>	<i>Departures</i>	<i>Net Migration</i>
1955	21.0	9.6	+ 11.4
1956	27.7	9.2	+ 18.5
1957	25.6	10.7	+ 14.9
1958	18.2	12.8	+ 5.4
1959	13.6	8.3	+ 5.3
1960	12.1	9.7	+ 2.4
1961	11.6	12.8	— 1.2
1962	10.3	12.2	— 1.9
1963(b)	9.1	17.2	— 8.1(c)

(a) Source: **Monthly Digest of Statistics, November, 1963**, Table 4. Central Statistical Office, Salisbury. Definitions of the terms used are given in the Notes on p.86 of the **Digest**.

(b) Annual rate based on figures for January-September, 1963.

(c) Professor G. Seltzer suggests that this large increase in emigration may indicate that abnormal wastage may be larger than has been allowed for in this Report.

49. An alternative method of arriving at the net flow of migrants into Southern Rhodesia is by comparing the census figures for 1956 and 1961 with the natural increase over this period. (For this purpose, only statistics relating to Europeans are considered, since the demographic data for Asians and Coloured is less certain and the numbers involved are negligible).

TABLE 20

**Estimates of Net Migration of Europeans into Southern Rhodesia
1956-61(a)
(Thousands)**

1961 Census	221
1956 Census	180
	<hr/>
Total increase	41
Natural increase	21
	<hr/>
Net migration	+ 20
	or + 4 per annum

(a) Source: **Monthly Digest of Statistics, November, 1963**, Tables 1 and 3. Central Statistical Office, Salisbury.

50. The figures in Table 20 indicate a net immigration of Europeans into Southern Rhodesia of the order of 4,000 per annum during the years 1956-1961. Assuming that conditions in 1954-1955 were roughly comparable, this would indicate a total net inflow for the period 1954-1961 of 28,000 persons.

51. However, it is not known what proportion of all immigrants may have possessed HLMP qualifications. In 1961 for the non-African population as a whole, including women and children, about one-third had such qualifications. If, as is likely, immigrants have fewer children on arrival than the average of the population, but are otherwise about similar in average skills and qualifications to the indigenous population, Southern Rhodesia may have acquired a net inflow of some 10,000 HLMP over the period, or about 1,400 a year.

52. The calculations in Tables 16 and 18 indicate that by 1970 Southern Rhodesia will be facing a deficit of between 23,000 and 35,000 HLMP, excluding any gains from immigration. Some of this deficit will be off-set by numbers of HLMP, formerly employed by the Federal Government, becoming available through the dissolution of the Federation. It is not possible to say how many former Federal Civil Servants will be prepared to accept employment in Southern Rhodesia. In addition the effect is likely to be short-lived. On the basis of the figures in paragraph 51, one might expect that a further 13,000 HLMP will be contributed by migration between 1961 and 1970, thus reducing the deficit by between one-third on Level II or one-half on Level I. However, as the figures in Table 19 show, the rate of emigra-

tion from the Federation has been accelerated since 1961 ; and although again no figures are available for individual territories*, it seems reasonable to assume that Southern Rhodesia has borne the major share.

53. It could be argued that the high rate of emigration in the last few years has been caused by a decline in certain sectors of the economy, notably building and construction and allied trades ; and that once this excess labour supply has been drained off, the rate of emigration can be expected to fall back to the pre-1961 level. This is an acceptable point of view, but in order to meet the economy's demands for HLMP, net immigration will need to be at least twice as high as during the period 1956-1961.

54. It is, of course, impossible to make any numerical predictions of the rate of migration, since this depends on so many qualitative factors as mentioned in paragraph 47 above. However, the balance of probability suggests that any realistic estimate of net migration of Europeans into Southern Rhodesia between now and 1970 would be well below the 1956-1961 figure. From the point of view of estimating future supplies of HLMP, this receives further support from the fact that the greater number of openings will be at the Category III level and hence unlikely to prove attractive to prospective immigrants.

55. No assumption has been included regarding net migration of African HLMP. Most other African countries are not able to do more than meet a part of their own needs, and any net migration seems more likely to be outward than inward. The most reliable and economical way of making up the deficit would be by an expansion of African secondary school opportunities throughout. This is particularly urgent at the lower levels because of the immediate need for Category III HLMP.

XI

CONCLUSIONS

56. The main conclusions of this *Report* are summarised below:

- (a) the total stock of HLMP in Southern Rhodesia in 1961 may be estimated to have been about 125,000 ;
- (b) there is assumed to be a relationship between the growth of the economy, measured by the figures of Gross Domestic Product at constant prices, and the demand for HLMP ;
- (c) if GDP at 1954 prices is extrapolated to 1970 and it is assumed that HLMP demands grow at least as quickly and perhaps as much as one and a quarter times as fast as GDP, then the required stock of HLMP in 1970 will lie between 180,000 and 190,000 ;

*It is now known that in March Quarter, 1964, approximately 4,000 (net) Europeans emigrated from Southern Rhodesia.

- (d) when estimates of both normal and abnormal wastage are taken into account, this implies a demand for HLMP of approximately 100,000 plus or minus 5,000 between 1961 and 1970;
- (e) on present plans, the out-turn of the educational system, both African and non-African, can only be expected to produce 73,000 HLMP, leaving a gap of approximately 29,000 plus or minus 5,000 to be filled from elsewhere;
- (f) the evidence concerning both past and present trends in net migration of non-Africans suggest that, even on the most optimistic assumptions, immigration cannot be expected to make up more than one-third to one-half of this deficit; finally,
- (g) the assumed rate of economic growth does little more than allow for the maintenance of the present level of real income per head; thus the failure to secure the required numbers of HLMP could have the effect of reducing the rate of economic growth below the rate of population increase, leading to declining real incomes per head.

APPENDIX I

Estimated Growth in HLMP in Southern Rhodesia, 1954 to 1961

- Assumptions: (i) that the ratio of non-African HLMP to total non-African employment has remained constant;
- (ii) that total HLMP has grown *pari passu* with GDP at constant prices.

- Calculations: (i) Total non-African employment in 1961 = 88,500
 Non-African HLMP in 1961 = 78,190
 $\frac{78,190}{88,500} = 88.35\%$
 Total non-African employment in 1954 = 65,600
 Non-African HLMP in 1954 = $65,600 \times 88.35\% = 57,960$
- (ii) The "Supplement to the National Accounts of the Federation of Rhodesia and Nyasaland, 1954-1962", gives a trend equation for this period:
 $GDP = 159.9 + 21.9t - 1.3t^2$
 giving a percentage rise of 56 per cent on trend values of GDP between 1954 and 1961.
 Alternatively a linear trend can be calculated giving:
 $GDP = 168.9 + 12.9t$
 On this basis the percentage rise in trend values between 1954 and 1961 is 54 per cent.
 Assuming a percentage rise in GDP of 55 per cent, i.e. mid-way between the above, then
- $$HLMP \text{ in } 1954 = 124,600 \times \frac{100}{155} = 80,400$$
- $$Non-African \text{ HLMP in } 1954 = 58,000$$
-
- Hence, African HLMP in 1954 = 22,400

Accordingly, non-African HLMP rose by 35 per cent, and African HLMP rose by 107 per cent between 1954 and 1961.

Thus the proportion of African HLMP to total employment (excluding domestic) service is:

1954=4.64 per cent

1961=8.77 per cent

APPENDIX II

Estimated Required Stock of HLMP in Southern Rhodesia in 1970

The two levels

I That HLMP requirements grow at 1:1 ratio with rate of growth of GDP.

II That HLMP requirements grow at 1.25:1 ratio with the rate of growth of GDP.

Appendix I gives two alternative growth trends of GDP in Southern Rhodesia from 1954 to 1961, viz.

$$\text{GDP} = 159.9 + 21.9t - 1.3t^2 \dots \dots (1)$$

$$\text{GDP} = 168.9 + 12.9t \dots \dots (2)$$

Trend (1) has a downward movement beyond the point where $t = 21.9$

$t = \frac{21.9}{2.6}$. This is reached when $t = 9$, or in 1963, and this

trend cannot be used for extrapolation to 1970.

Using trend (2) the extrapolated value of GDP in 1970 =

$$168.9 + (16 \times 12.9) = 362.4 = 40 \text{ per cent rise on 1961.}$$

Since this trend is derived from a series which includes periods of both very rapid growth and very little growth, it would appear to be the best that can be devised under the circumstances; and an annual increase of 4.45 per cent of the 1961 total or a 3.7 per cent geometric rate of growth to 1970 do not seem unrealistic. However, it must be stressed that the actual future performance of Southern Rhodesia's economy will be subject to both political and economic influences which cannot be foreseen.

Using the hypothesis of a 40 per cent rise in GDP between 1961 and 1970, the required stock of HLMP in 1970 may be calculated as in Table 7.



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